(12) UK Patent Application (19) GB (11) 2 222 991 (13) A

(43) Date of A publication 28.03.1990

(21) Application No 8918507.8

(22) Date of filing 14.08.1989

(30) Priority data
(31) 3827879 (32) 17.08.1988 (33) DE

(51) INT CL⁴
B60R 1/08

(52) UK CL (Edition J)
B7J J69

(56) Documents cited
None

(58) Field of search
UK CL (Edition J) B7J
INT CL⁴ B60R
WPI

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(54) Vehicle exterior rear view mirror

(57) A vehicle exterior rear-view mirror has a mirror glass 4 pivotable in a housing 3 about a vertical axis 5 by means of a randomly activatable actuator 7 and with a switch device 9, by means of which the actuator 7 is furthermore also activatable automatically when a switch of the direction indicator assigned to the exterior mirror is closed and an object-recognition signal 9.1 is generated by a transmitter/receiver device 8 arranged in the rear-view mirror and covering a blind viewing sector.

Fig. 2

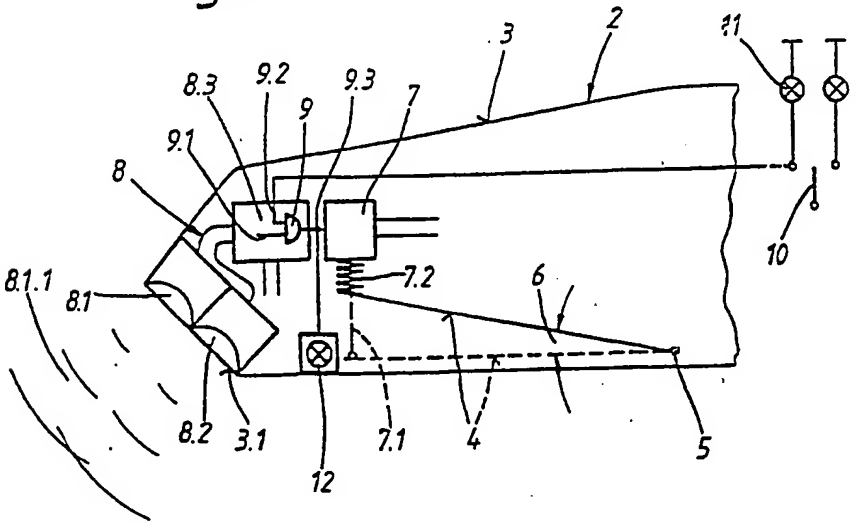

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Fig.1

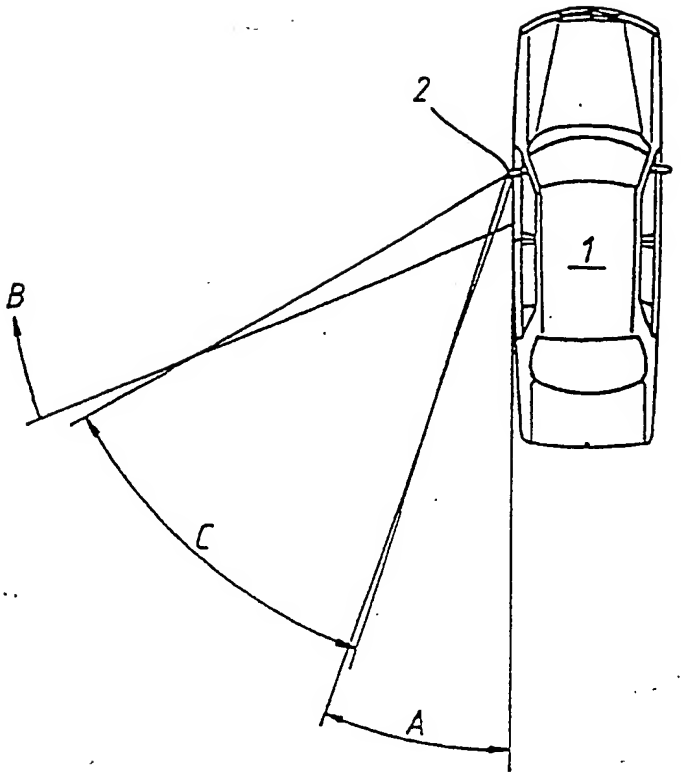
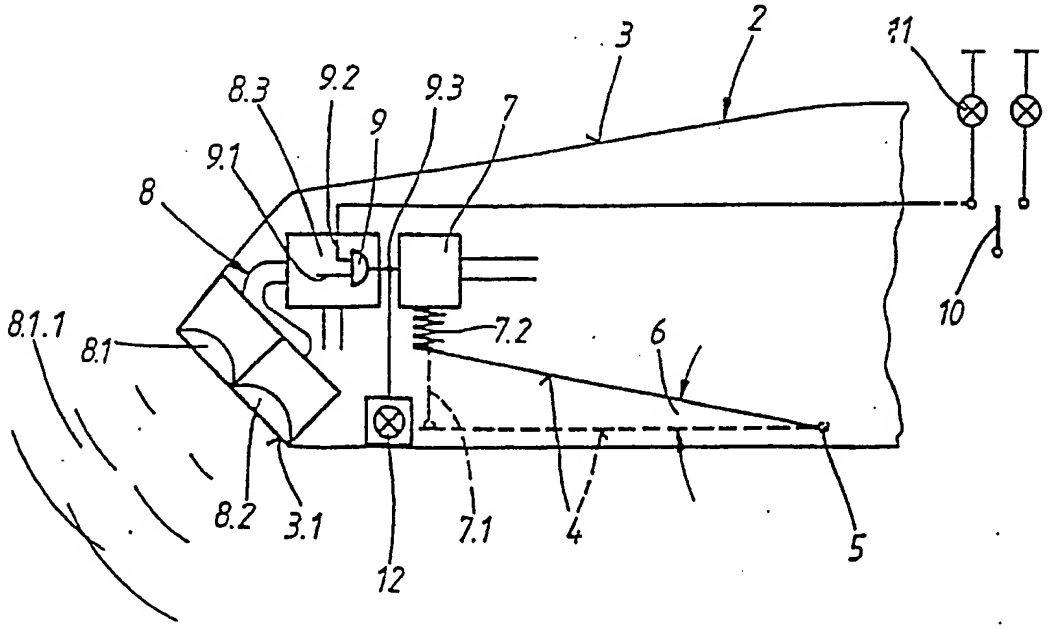


Fig. 2



Vehicle exterior rear-view mirror

The invention relates to a vehicle exterior rear-view mirror with a mirror glass pivotable in a mirror housing about a vertical axis by means of a selectively activatable actuator, and with a switch device, by means of which the actuator is furthermore also activatable automatically to pivot the mirror glass out of its initial position into a position covering a viewing sector located in the blind spot when a switch of the direction indicator assigned to the exterior rear-view mirror is closed.

Such an exterior rear-view mirror of the relevant generic type is already known (German Offenlegungsschrift 2,736,900). On the one hand, the mirror glass of this exterior rear-view mirror can be selectively randomly adjusted by power actuation from the vehicle interior, and on the other hand it is adjusted automatically, likewise by power actuation, into a position covering a viewing sector located in the "blind spot", when the corresponding direction indicator is actuated, in order thereby to enable the vehicle driver to gain a view of the "blind spot" before the change of direction. Although this design of the rear-view mirror has already solved the problem of covering the "blind spot", it could be considered a disadvantage that an automatic (non-random) adjustment of the mirror always takes place during the actuation of the direction indicator, irrespective of whether there is an object in the "blind spot" or not.

Moreover, there is a known device for detecting other vehicles in the rear viewing range of a vehicle (German Offenlegungsschrift 3,313,866), which has a distance-measuring device which works on the ultrasonic, infrared or radar principle and is mounted laterally on the rear part of the vehicle and the measuring beam of which is directed laterally towards the overtaking track and to the viewing sector located in the blind spot, and

by means of which an indicator for the driver can be switched on in the vehicle interior when a vehicle is detected by the measuring beam. Here too, there is a switch device, but this allows the indicator to be switched on only when the direction indicator is actuated simultaneously, in order thereby to prevent the driver from being needlessly irritated. Although, with this device, an object located in the viewing sector of the "blind spot" is signalled to the driver, nevertheless he cannot see this in the exterior rear-view mirror.

The invention seeks to provide a vehicle exterior rear-view mirror in which the driver, when he intends to change direction, obtains a view of the viewing sector in the blind spot via the rear-view mirror only when an object is actually located in this sector.

According to the invention, there is provided a vehicle exterior rear-view mirror with a mirror glass pivotable in a mirror housing about a vertical axis by means of a selectively activatable actuator, and with a switch device, by means of which the actuator is furthermore also activatable automatically to pivot the mirror glass out of its initial position into a position covering a viewing sector located in the blind spot when a switch of the direction indicator assigned to the exterior rear-view mirror is closed, wherein a transmitter/receiver device is arranged in the mirror housing in such a way that its measuring beam cone is directed at the viewing sector located in the blind spot outside the normal viewing sector of the rear-view mirror, and the switch device is adapted to activate the actuator automatically by means of a signal only when there is, in addition to the switch signal produced by activating the direction indicator switch, also an object-recognition signal produced by the transmitter/receiver device.

Preferably, after the lapse of at least the object-recognition signal or the switch signal, the mirror glass is returned to its initial position.

The switch device signal at the same time may

activate an indicator arranged and visible in the mirror housing.

The transmitter/receiver device may comprise an ultrasonic, infrared, radar or other electromagnetic wave device.

Although a multiplicity of devices for solving the problem is known, the invention affords the decisive advantage that the driver is given the important information, namely that an object is located in the viewing sector of the blind spot, in the way familiar to him, namely via the rear-view mirror, specifically only when he actually intends to change direction. There is therefore no cause to interpret indications or experience irritation because of a continual adjustment of the mirror glass.

An embodiment of the invention will now be described by way of example with reference to the drawing. In this:

Fig. 1 shows a diagrammatic representation of the various viewing sectors, and

Fig. 2 shows a top view of an exterior rear-view mirror in a diagrammatic representation.

The vehicle 1 illustrated in Fig. 1 has, especially on its left vehicle side, an exterior rear-view mirror 2, via which the vehicle driver is given the viewing sector A, whilst by looking into the exterior rear-view mirror he can also still see directly the sector B. Between these sectors there is the viewing sector C located in the "blind spot" for the driver.

So that it is possible to see even this viewing sector C, the exterior rear-view mirror 2 according to Fig. 2 is designed as follows. A mirror glass 4 is mounted in a known way in a mirror housing 3 so as to be pivotable through the angle 6 about a vertical axis 5. A selective random pivoting can be caused by the actuation of a switch located in the vehicle interior, serving the purpose of adjusting the mirror glass 4 according to the driver and the position of his seat, with the result that an actuator 7 arranged in the mirror housing 3 is activated via a mechanical connection 7.1 in order to adjust the mirror

glass 4 to a desired normal setting.

Moreover, also arranged in the mirror housing 3 is a transmitter/receiver device 8 consisting of a transmitter 8.1, of a receiver 8.2 and of evaluation electronics 8.3, the transmitter and receiver being so arranged on the end face 3.1 of the mirror housing 3 pointing away from the vehicle that the set measuring-beam cone 8.1.1 produced by the transmitter 8.1 covers the viewing sector C in the "blind spot". Furthermore, there is a switch device 9, integrated in the electronics 8.3, which is designed as an AND element and onto which, on the one hand, an object-recognition signal 9.1 from the electronics 8.3 and, on the other hand, a switch signal 9.2 can be fed and which generates a switch device signal 9.3 when the signals 9.1 and 9.2 occur simultaneously. The switch signal 9.2 occurs when a switch 10 of the left direction indicator 11 assigned to the rear-view mirror 2 is closed. Ultrasonic, infrared, radar or other electromagnetic waves can be used in principle for the measurement, and the signal emitted by the transmitter, reflected from an object and received again by the receiver is converted into the object-recognition signal by the electronics.

The mode of operation is as follows:
Objects within the predetermined measuring beam cone 8.1.1 can be recorded by the transmitter/receiver device 8, and when there is an object present the object-recognition signal 9.1 is produced by the evaluation electronics 8.3 and fed to the switch device 9. When the driver also actuates the switch 10 for the direction indicator 11, because he intends to turn off, overtake, etc., that is to say change his driving direction, the switch signal 9.2 also occurs at the switch device 9, and therefore the latter generates the switch device signal 9.3 which activates the actuator 7, whereupon the mirror glass 4 is pivoted out of the initial position represented by broken lines into the position represented by unbroken lines, in which the driver can now see the viewing sector C in the hitherto "blind spot" and can therefore recognize the

object via the rear-view mirror. By means of an additional indicator 12 which is likewise arranged in the mirror housing 3 so as to be visible to the driver and which, moreover, is likewise activated by the switch device signal 9.3, the driver can be informed visually that the mirror glass 4 has been adjusted. When the object has left the viewing sector in the "blind spot" again, the object-recognition signal 9.1 lapses, so that the mirror glass 4 is pivoted back into its normal position (= initial position) again, this being obtainable, for example, by means of a spring 7.2 or by reversing the actuator, and the indicator 12 is deactivated. The same also applies when the driver opens the switch 10 again, since the switch signal 9.2 then lapses.

Claims

1. A vehicle exterior rear-view mirror with a mirror glass pivotable in a mirror housing about a vertical axis by means of a selectively activatable actuator, and with a switch device, by means of which the actuator is furthermore also activatable automatically to pivot the mirror glass out of its initial position into a position covering a viewing sector located in the blind spot when a switch of the direction indicator assigned to the exterior rear-view mirror is closed, wherein a transmitter/receiver device is arranged in the mirror housing in such a way that its measuring beam cone is directed at the viewing sector located in the blind spot outside the normal viewing sector of the rear-view mirror, and the switch device is adapted to activate the actuator automatically by means of a signal only when there is, in addition to the switch signal produced by activating the direction indicator switch, also an object-recognition signal produced by the transmitter/receiver device.

2. A vehicle exterior rear-view mirror according to Claim 1, wherein after the lapse of at least the object-recognition signal or the switch signal, the mirror glass is returned to its initial position.

3. A vehicle exterior rear-view mirror according to Claim 1 or 2, wherein the switch device signal at the same time activates an indicator arranged and visible in the mirror housing.

4. A vehicle exterior rear-view mirror according to Claim 1, 2 or 3, wherein the transmitter/receiver device comprises an ultrasonic, infrared, radar or other electromagnetic wave device.

5. A vehicle exterior rear-view mirror with a mirror glass pivotable in a mirror housing about a vertical axis substantially as described herein with reference to, and as illustrated in, the accompanying drawings.

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